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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,227	06/22/2001	Anant Sahai	60021-0012	7531

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EXAMINER	
AHN, SAM K	

ART UNIT	PAPER NUMBER
2637	

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/888,227	SAHAI ET AL.	
	Examiner	Art Unit	
	Sam K. Ahn	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-87* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-87* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 1,2-5 and 19-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims not within technological art.

The invention as recited in the claims is merely an abstract idea that is not within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena) that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful arts" (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. In the instance case, none of the aforementioned claims are recited as within technological art such as being carried out on a computer system. Claims 1,2-5 and 19-32 are accordingly rejected under 35 U.S.C. 101 as being non-statutory subject matter.

Claims not limited to practical application.

Assuming that the claimed invention is carried out on a computer (i.e. rendering the claimed invention in the technological art), it is asserted that the Subject Matter as claimed fails produce a "useful, concrete and tangible result."

Claims 1,2,4 and 19: recite an abstract idea "a method for summing integrals..". However, the claim fails to provide any practical application of the

abstract idea. The claim recites summing the weighted pairs of I and Q correlation values at the target frequency. Mere computation of correlation values as claimed fails to produce a concrete and tangible result.

Note that this exemplary analysis also applies to claims 1,2,4 and 19. The applicant is required to thoroughly review all claims in light of this analysis and take appropriate corrective action.

In conclusion, claims 1,2-5 and 19-32 are rejected as being directed to a non-statutory subject matter under 35 U.S.C. 101, wherein claims 3,5 and 20-32 directly or indirectly depend on claim 2,4 or 19.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-87 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1,2,4,19 in lines 1-2, respectively, recite "*A method for summing (I and Q correlation) integrals at a target frequency...*" and wherein the body of the claim does not refer back to the carrier frequency at a target frequency. Thus, the claim is indefinite as the claim does not recite how the *summing integrals* is related to the final step of the claims of "*summing the weighted pairs of I and Q correlation values...*".

In claims 7,33 and 59, in lines 1-2, respectively, recite "*A method for estimating a carrier frequency at a target frequency...*" and wherein the body of the claim does not refer back to the carrier frequency at a target frequency. Thus, the claim is indefinite as the claim does not recite how the *estimating a carrier frequency* is related to the final step of the claims of "*summing the weighted pairs of I and Q correlation values...*".

Claims 3,5,8-18,20-32,34-58 and 60-87 directly or indirectly depend on claim 2,4,7,19,33 or 59.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 7-18 and 19-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akopian USP 6,735,243 B1 (cited previously) in view of Lang USP 5,566,202 and Rilling USP 6,628,969 B1.

   Regarding claims 1 and 19, Akopian teaches a method for summing integrals at a target frequency of a plurality of target frequencies, the method comprising the steps of: accessing a set of correlation values corresponding to a set of data blocks (see Fig.5) wherein: the set of data blocks together make up a sampled

data that is associated with a received signal (section 0 ~ section $N_{se} - 1$); and each correlation values from the set of correlation values corresponds to a calculated correlation integrals that are integrated (combined or summed,note col.10, line 22 in Fig.5) over one corresponding data block from the se of data blocks at a plurality of frequencies from a set of frequencies (w_1~w_k).

However, Akopian does not teach selecting correlation values that is closest to the target frequency, but combines the correlation values for each of the frequencies.

Lang teaches selecting (86,88 in Fig.2) correlation values that is closest to the target frequency (note col.2, lines 9-14 and col.3, line 40 – col.4, line 16).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Lang in the system of Akopian by selecting the correlation that is closest to the target frequency for the purpose of further executing the step of providing frequency compensation signal (output of 26 in Fig.1) through the selected correlation value, and thus control the timing of quantizing (in 14,16).

However, Akopian in view of Lang do not explicitly teach weighting and summing the selected correlation values, wherein each of the values are represented as I and Q values.

Rilling teaches receiving the selected correlation values (output of 20 in Fig.1) weighting (26) and summing (30) the weighted pairs of I and Q values.

Therefore, it would have been obvious to one skilled in the art at the time of the

invention to incorporate the teaching of Rilling in the system of Akopian in view of Lang by coupling the output of selector (MUX in Fig.2 of Lang) to the weighting step (26) for the purpose of producing a feedback signal to reduce interference, as taught by Rilling (note col.4, lines 6-8). And further, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian and Lang by computing the correlation values represented as I and Q values, as computation in any part of a transmitter or a receiver as in-phase or quadrant, as computation in I and Q values are well-known in the art as these values simplifies computation in any part of the system.

Regarding claims 7,13 and 14, Akopian teaches a method for summing integrals at a target frequency of a plurality of target frequencies, the method comprising the steps of: accessing a set of correlation values corresponding to a set of data blocks (see Fig.5) wherein: the set of data blocks together make up a sampled data that is associated with a received signal (section 0 ~ section $N_{se} - 1$); and each correlation values from the set of correlation values corresponds to a calculated correlation integrals that are integrated (combined or summed,note col.10, line 22 in Fig.5) over one corresponding data block from the se of data blocks at a plurality of frequencies from a set of frequencies (w_1~w_k). Akopian further teaches dividing the range of frequency into a first set of frequency

intervals (coarse) and second set of frequency intervals (fine, note col.2, lines 45-48 and 60-63 and col.8, lines 20-25).

However, Akopian does not teach selecting correlation values that is closest to the target frequency, but combines the correlation values for each of the frequencies.

Lang teaches selecting (86,88 in Fig.2) correlation values that is closest to the target frequency (note col.2, lines 9-14 and col.3, line 40 – col.4, line 16).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Lang in the system of Akopian by selecting the correlation that is closest to the target frequency for the purpose of further executing the step of providing frequency compensation signal (output of 26 in Fig.1) through the selected correlation value, and thus control the timing of quantizing (in 14,16).

However, Akopian in view of Lang do not explicitly teach weighting and summing the selected correlation values, wherein each of the values are represented as I and Q values.

Rilling teaches receiving the selected correlation values (output of 20 in Fig.1) weighting (26) and summing (30) the weighted pairs of I and Q values.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian in view of Lang by coupling the output of selector (MUX in Fig.2 of Lang) to the weighting step (26) for the purpose of producing a feedback signal to reduce interference,

as taught by Rilling (note col.4, lines 6-8). And further, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Rilling in the system of Akopian and Lang by computing the correlation values represented as I and Q values, as computation in any part of a transmitter or a receiver as in-phase or quadrant, as computation in I and Q values are well-known in the art as these values simplifies computation in any part of the system.

Regarding claims 8 and 10, Akopian in view of Lang and Rilling teach all subject matter claimed, as applied to claim 7. Akopian further teaches wherein the received signal is from a known signal source (GPS system, note col.1, line 15) and further teaches a trial frequency value (Wc in Fig.5).

Regarding claims 11 and 12, Akopian in view of Lang and Rilling teach all subject matter claimed, as applied to claim 10. Although Akopian teaches a trial frequency, Akopian does not explicitly teach a mid-point of each frequency interval to be the trial frequency. However, it would have been obvious to one skilled in the art at the time of the invention to implement as such, since the mid-point frequency value would provide an optimal choice to quickly shift between the left and right of the mid-point, thus efficiently adjusting the trial frequency, adjusting the frequency shit by the design choice as necessary, as taught by Akopian (note ol.8, lines 8-19).

Regarding claims 15-17,20-22,24 and 31, Akopian in view of Lang and Rilling teach all subject matter claimed, as applied to claim 7 or 19. Akopian further teaches wherein all of the data blocks comprising the set of data blocks have the same length (having same code period), wherein the set of data are sampled (as received signals are samples, in Fig.5), and further wherein the frequency intervals are pre-selected (note col.8, lines 8-19 having interval of 1 kHz).

Regarding claims 18,23,25-28,30 and 32 Akopian in view of Lang and Rilling teach all subject matter claimed, as applied to claim 7 or 19. Akopian further teaches wherein the received signal is a GPS signal (note col.1, line 15) determined based on intermediate frequency employed by a receiver and a Doppler shift associated with GPS vehicle (note col.1, line 37).

Regarding claims 9 and 29, Akopian in view of Lang and Rilling teach all subject matter claimed, as applied to claim 7 or 19. Akopian further teaches wherein for each data block in the set of data blocks, the calculated correlation integrals are calculated for each hypothesized delay value over a range of hypothesized delay values (estimating code phase n_c , note col.5, lines 48-53).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
9/14/05

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PRIMARY EXAMINER
SKM-Note. 9/16/05